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THE ATOM

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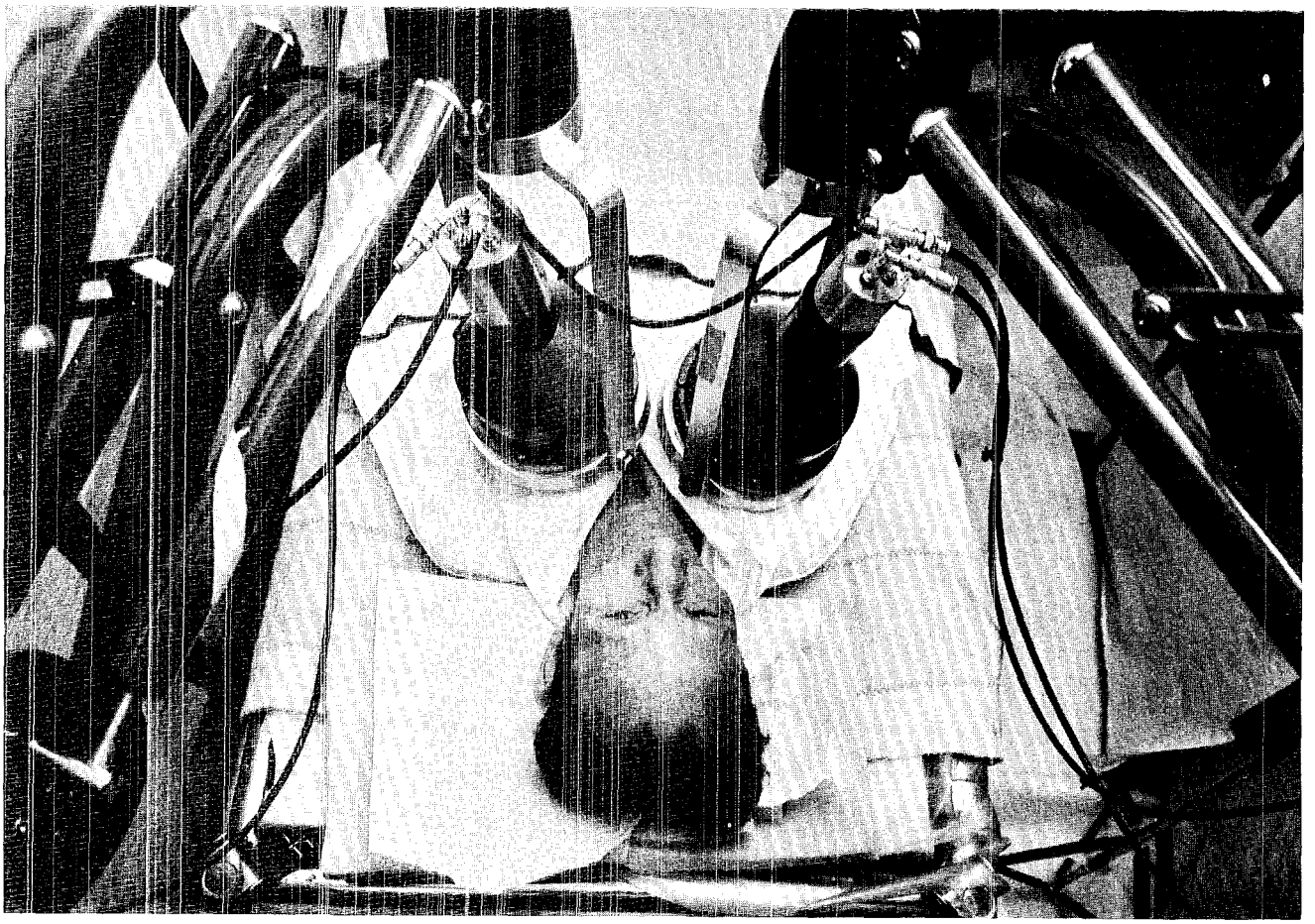

Use of the plutonium lung counter is demonstrated on Lee Carr, H-4. The detectors are positioned over the lung cavity. A reverse of the same photograph appears on the cover of this month's edition of "The Atom."

The Plutonium Lung Counter:

a new approach to an old problem

By Bill Richmond

A speck of plutonium no larger than a particle of common house dust is colorless, odorless, and can be exceedingly dangerous.

But, in many cases, employees of the Los Alamos Scientific Laboratory work in areas where plutonium may exist in this form and can be inhaled.

Masks and other protective gear are worn and periodic urinary assays for plutonium are taken. However, these assays provide a measure of systemic burden and provide no reliable information on lung burden. Evaluation of the plutonium lung burden in chronically exposed process operators is necessary for proper industrial medical control.

Until just recently there has been no truly accurate method to directly measure the lung burden of this

continued on next page

heavy radioactive element. But now Phil Dean, H-4, has designed a plutonium lung counter which promises to do the job.

The three isotopes of most concern are plutonium-238, plutonium-239 and americium-241. "Most exposures of the lung are to insoluble plutonium," Dean said. "The plutonium doesn't dissolve but stays in the lungs. A urine test may show nothing but there may still be plutonium there."

The maximum permissible body burden of plutonium is 16 nanocuries. (A nanocurie is a billionth of a curie, a measure of the number of radioactive atoms disintegrating per second).

"We can see one nanocurie of plutonium-238 or three nanocuries of plutonium-239," Dean said. "We also measure and identify americium-241." It is necessary to detect lesser amounts of plutonium-238 than plutonium-239 because plutonium-238 is 250 times more harmful. That is, a speck of plutonium-238 will do as much harm to lungs as 250 specks of plutonium-239. LASL personnel work with both isotopes.

Inhalation is the normal method of exposure and the sole way to determine the lung burden of insoluble forms of the isotopes is by external counting.

This is no easy task, however, because the x rays emitted by plutonium are easily absorbed by the surrounding body tissue. Only eight-tenths of one per cent get to the chest surface for measurement. Thus, a low background reading and a high counting efficiency are prime requirements for an acceptable lung counter. The counter designed by Dean has both.

The idea behind Dean's counter is not new, but the method of approach is. Three different types of detectors have been used at LASL to measure plutonium in the lung, with one finally being chosen as the best.

The first, and the oldest, is the gas-filled proportional counter. Although it has many advantages, it also has the serious disadvantage of having a counting efficiency of less than 20 per cent. The counting efficiency refers to the percentage of incident particles the counter is able to detect and record. This figure of 20 per cent can be improved but to obtain a higher figure involves the use of expensive gas and consequently the use of complicated gas handling techniques.

Another type of detector which has been tried is the solid state detector. The greatest disadvantage for this type is its size, i.e., it can measure only a small part of the lung at one time. Several detectors can be operated in parallel but with a greatly increased noise level which results in a high background count. Also, these detectors must be used at liquid nitrogen temperature and are quite expensive. These disadvantages nearly rule out the use of solid state detectors for routine chest counting.

The third type of detector, and

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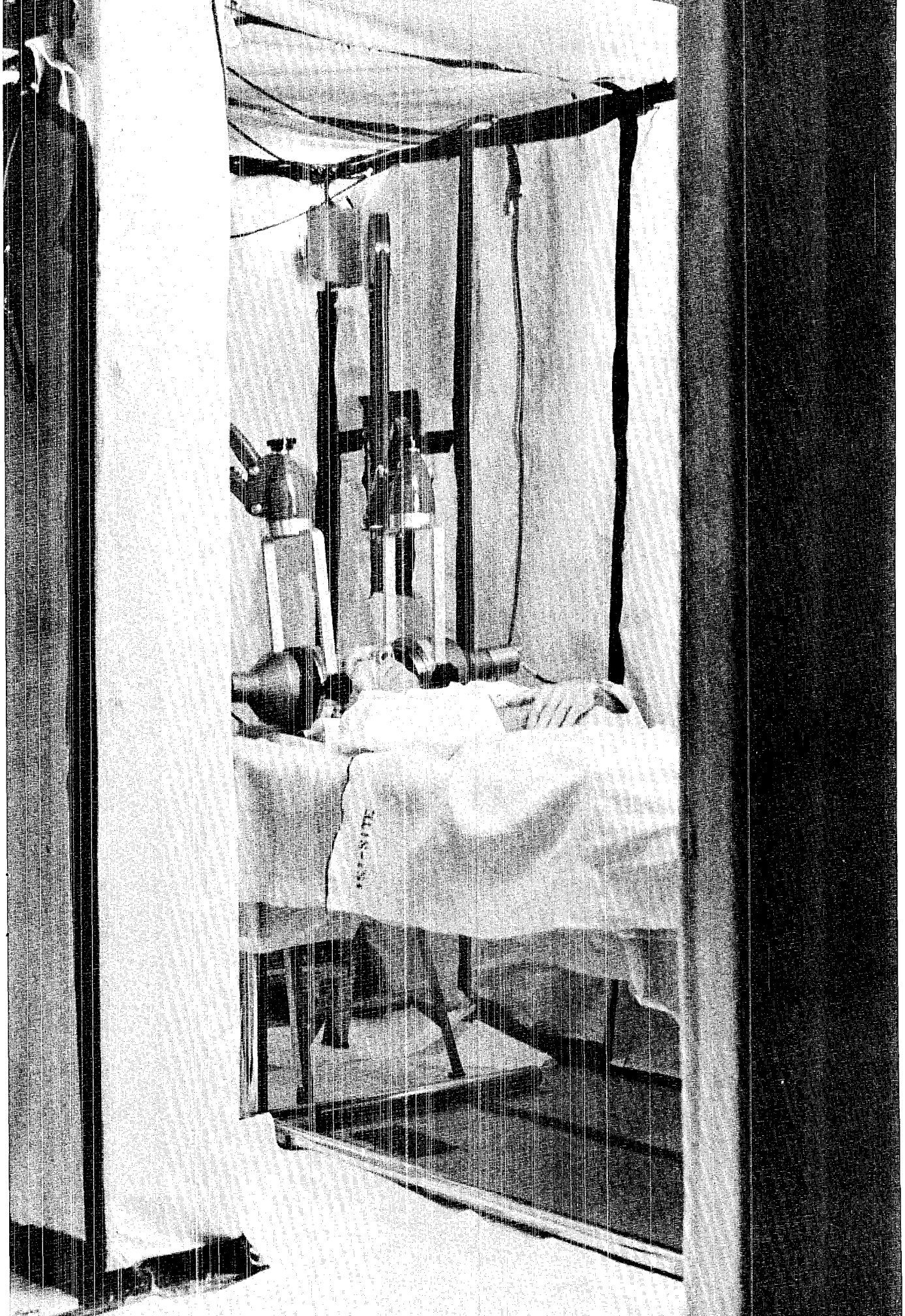
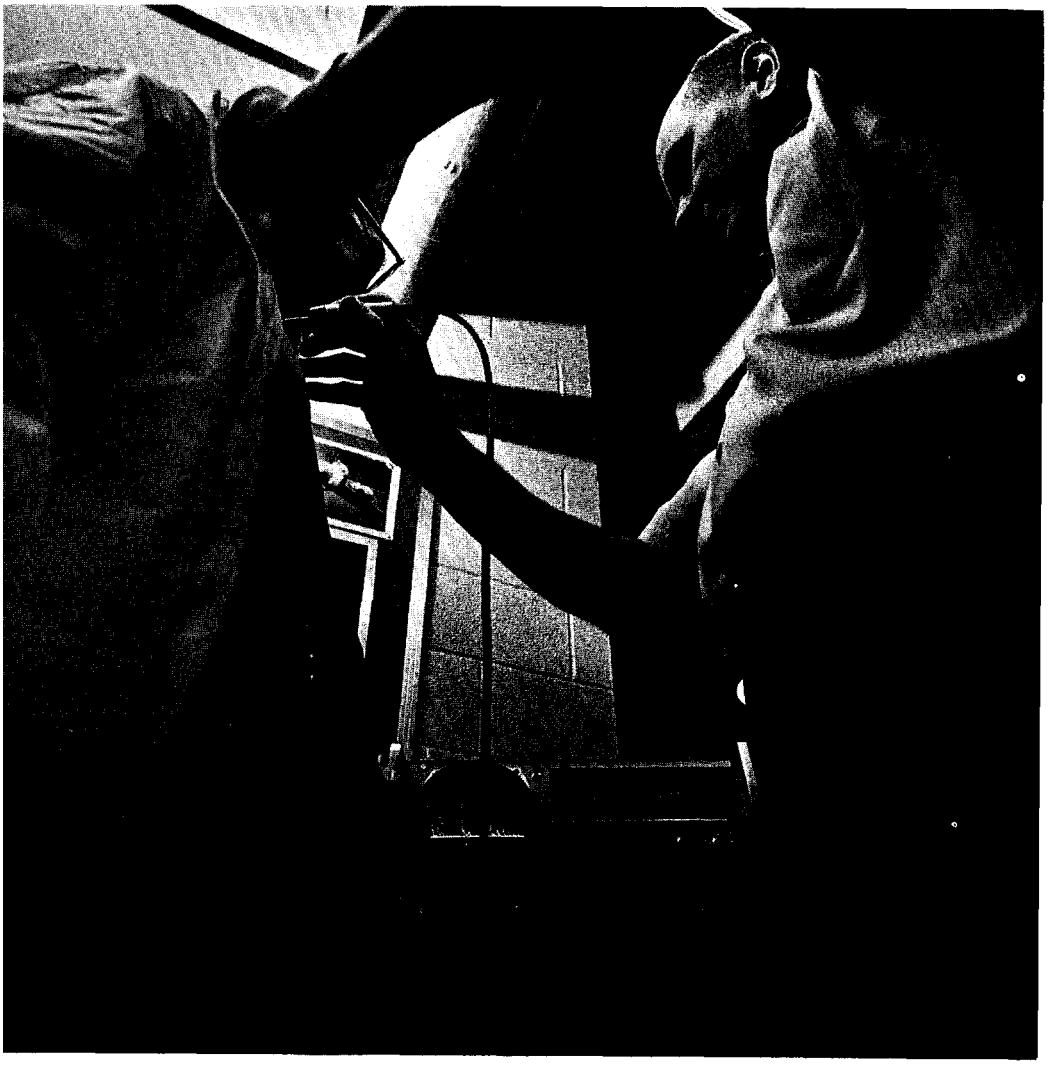
Above, Hal Ide, H-5, operates the console just outside the shielded room where personnel are counted. Right, inside the shielded room, Carr is used to demonstrate how lead-210 is counted. The detectors are placed on either side of his skull.





Phil Dean, H-4, right, determines the thickness of Ide's chest wall, using a miniature sonar instrument which sends out a pulse of sound.

the one selected by LASL as the best, is a thin inorganic scintillator using cesium iodide and sodium iodide. This detector has a 90 per cent counting efficiency and is used to measure the 60-keV gamma rays and 17-keV x rays from americium-241, a common contaminant of plutonium. If the amount of americium in the plutonium is known, a measurement of the 60-keV gamma rays can provide an indirect measurement of the amount of plutonium.

The counter designed by Dean, and operated by Hal Ide, H-5, uses a two-inch-thick cesium iodide crystal optically coupled to a three-millimeter-thick sodium iodide crystal and a photo-multiplier tube.

"We can cover an energy range of 10 through 100 keV," he said.

One of the unique aspects of the counter is the low background of only a few (two to four) counts per minute (cpm). Other counters designed for this job have a normal 30 to 40 cpm. The low background is achieved through a pulse-shape discrimination technique.

"Others working in this area said: 'Let's throw out what we don't want.' We said: 'Let's only look at what we do want'," Dean noted. This is what resulted in the low background.

About 400 LASL people work with plutonium and all have been counted by Dean's counter. They will continue to be counted on an annual basis.

In counting, a man is brought to the basement of the Health Research Laboratory building where his chest wall thickness is measured, along with his height, weight and chest circumference. The thickness of the chest wall varies among individuals. It is measured by a miniature sonar instrument which sends out a pulse of sound. The echo then enables Dean and Ide to determine its thickness. The counter is then calibrated to compensate for this measurement.

The man is then taken into a shielded room where he lies on a cot and the two detectors are positioned. Each detector is mounted on an extendible arm, the type used with dental x-ray tubes. They can be positioned independently of one another and can, therefore, be used to count any part of the body.

The shielding in the room is seven inches of steel and one-eighth inch of lead. The steel was produced before the start of atmospheric testing and thus is relatively free of fallout products. This helps to greatly reduce the background count.

The subject is then "counted" for approximately 30 minutes.

Just outside the room the machine operated by Ide spews out the information on the amount of the particular isotope being counted. The procedure followed in analyzing the data from a lung count is different for each isotope.

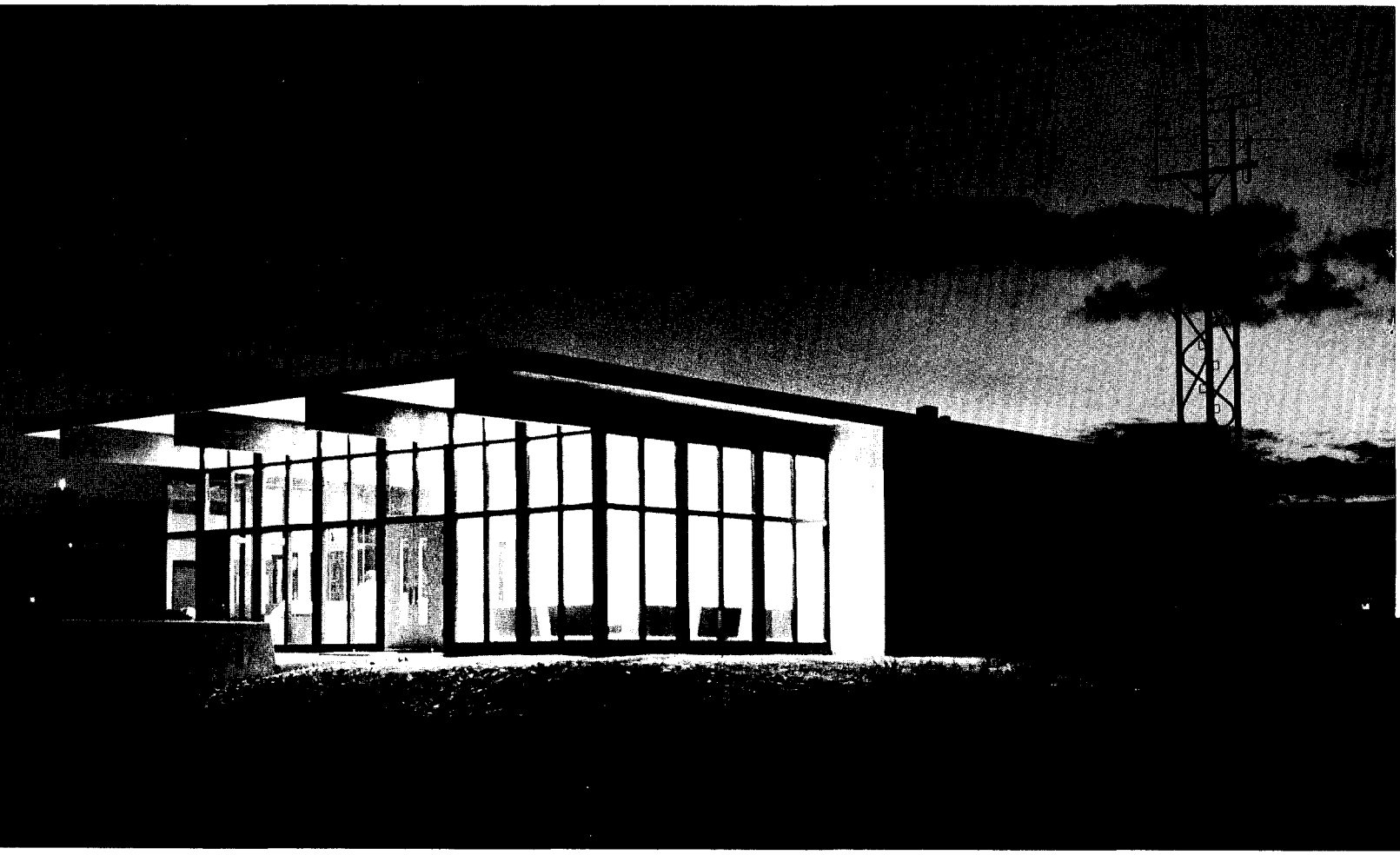
The counter can determine instantly the amount of plutonium in the lungs of the subject, allowing, of course, for a small margin of error.

There are several areas where errors might creep in. These are counting statistics of the room background and count rate of the subject, the estimates of the natural background of the subject, detector positioning errors and inherent errors in calibration due partly to errors in estimating the thickness of the chest wall.

However, even allowing for errors, the detector is capable of detecting as little as 17 per cent of a maximum permissible lung burden of plutonium-239 and six per cent of a maximum permissible lung burden of plutonium-238. The accuracy of a measurement of eight nanocuries (one half the maximum permissible lung burden) is felt by Dean to be about 30 per cent and is expected to improve as more calibration data become available.

This detector has also been used recently to measure lead-210 in the skull of uranium miners. This is being done in cooperation with the U.S. and New Mexico Departments of Public Health as a part of an effort to try to relate lung dose to air concentrations of radon and radon daughters in uranium mines. In the counting procedure one detector is placed on each side of the skull and a 30-minute count taken. To date, 15 miners from the Grants area have been counted. Additional miners from the Grants area and Grand Junction, Colo., are scheduled to be counted in the future.

U.S. Army General Lyman Lemnitzer (retired) talks with LASL Director Harold Agnew and W-Division Leader Robert Shreffler. Lemnitzer, who was the North Atlantic Treaty Organization's Supreme Allied Commander, Europe, from 1963 until shortly before his retirement in 1969, talked at a LASL staff meeting on "The Importance of NATO."



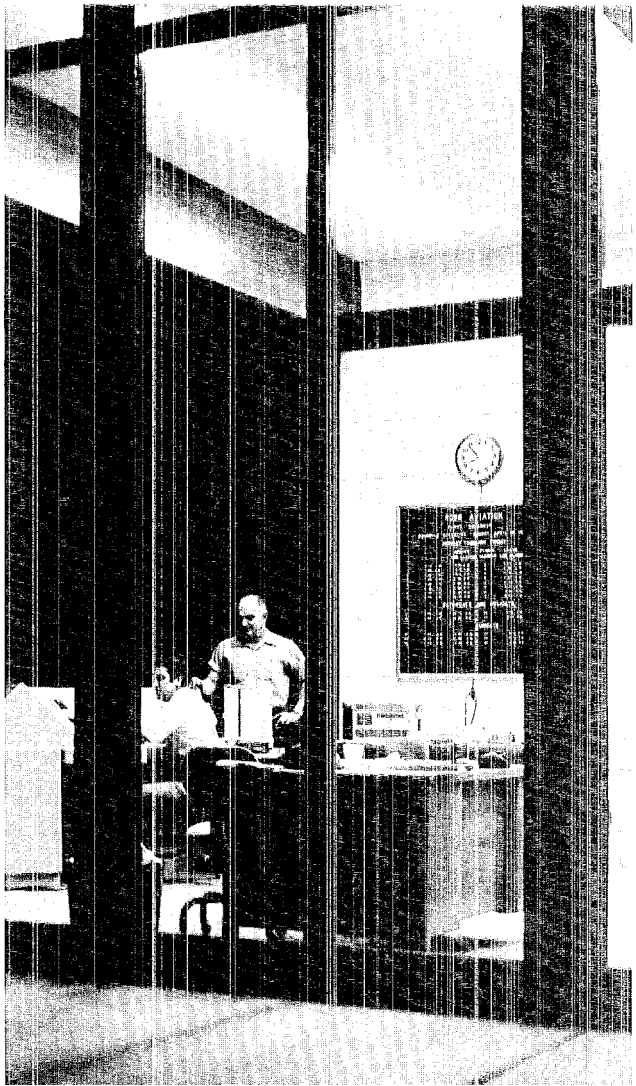
The New Los Alamos Airport Terminal

From wood-frame to glass

Right, Ross Aviation pilots check their manifests with Zia Dispatcher Nick Salazar as passengers relax in the terminal's spacious waiting room.

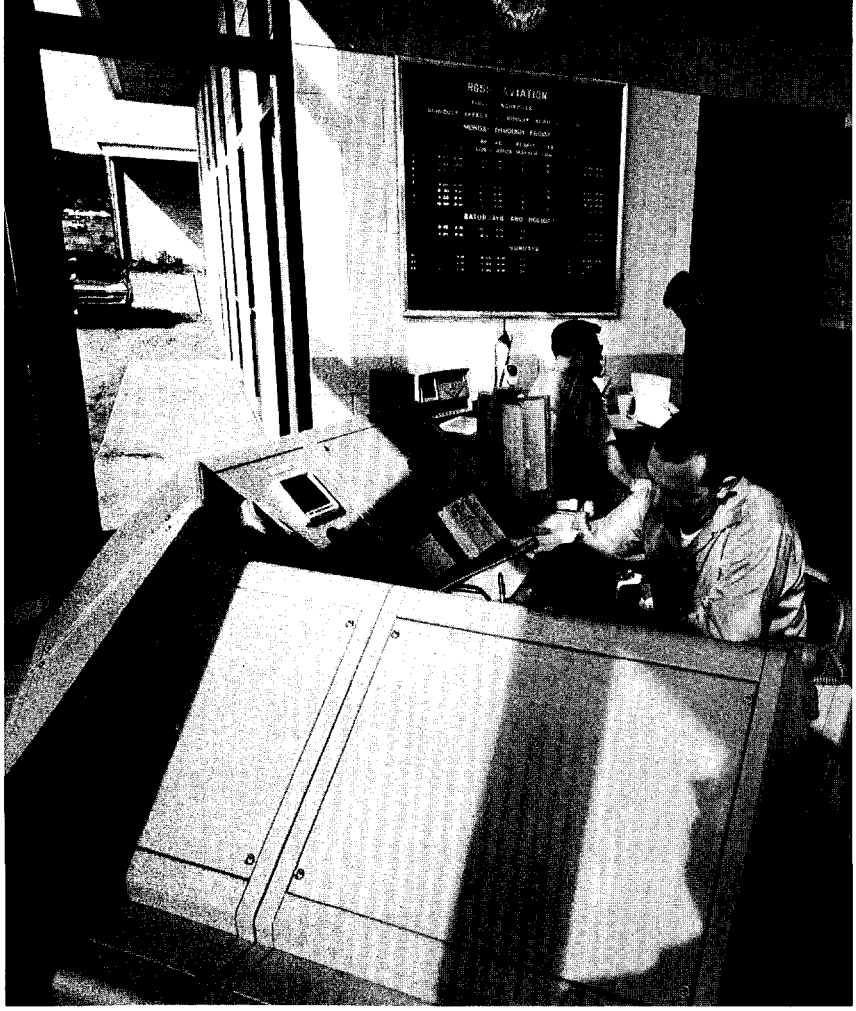
Left, a small, wood-frame wartime building that served as the Los Alamos airport terminal for more than 20 years has been razed, and terminal activities have been moved into this larger, modern structure, shown at sunset.

Below, near the end of the night shift, dispatchers Salazar and Bob Ebelacker watch for the arrival of the next flight.



At dawn, Flight No. 2 is called and passengers start for the runway gate.

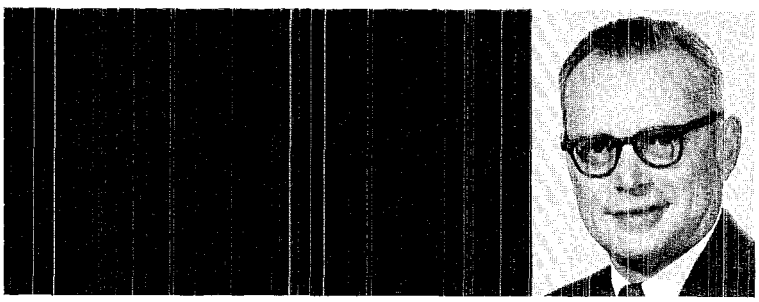
Right, at the console in the foreground is Senior Dispatcher Charles Hammond. Behind him, Senior Dispatcher Tony Lujan goes over a flight manifest with Ross Aviation Pilot Wayne Kunkel.



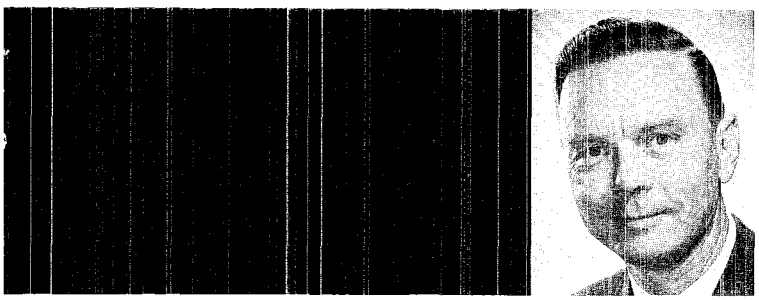
Below, Hammond mans the communications console as passengers prepare to load a morning flight.

The ramp leading from the parking lot to the new terminal is marked "Los Alamos, New Mexico, Elevation 7150."

Consolidation of LASL's Information Services



Phillip Belcher



Delbert Sundberg

A new department has been formed to consolidate most of the major information services at the Los Alamos Scientific Laboratory. The formation of the Information Services department (ISD) was part of a reorganization announced by Harold Agnew, director of the Laboratory.

The reorganization affected more than 180 persons in D-division, and the Public Relations and Mail and Records departments. D-division was dissolved. Eleven of its members have become a staff entity under the Director's Office while the rest of the division has been incorporated into the newly formed Information Services department. Mail and Records department and the two groups which made up the Public Relations department were also absorbed by ISD.

Under the reorganization plan, Phillip Belcher, former D-division leader and assistant director for classification and security, becomes assistant director for security and legal liaison. Henry Heyman, who was alternate D-division leader, is assistant to Belcher for legal liaison. Mary Ann Ford is the secretary for Belcher and Heyman.

Paul Gaetjens is assistant to Belcher for patents and inventions. In his group are Edward Walderscheid, Margarett Fuller, and Jo Ann Barnes.

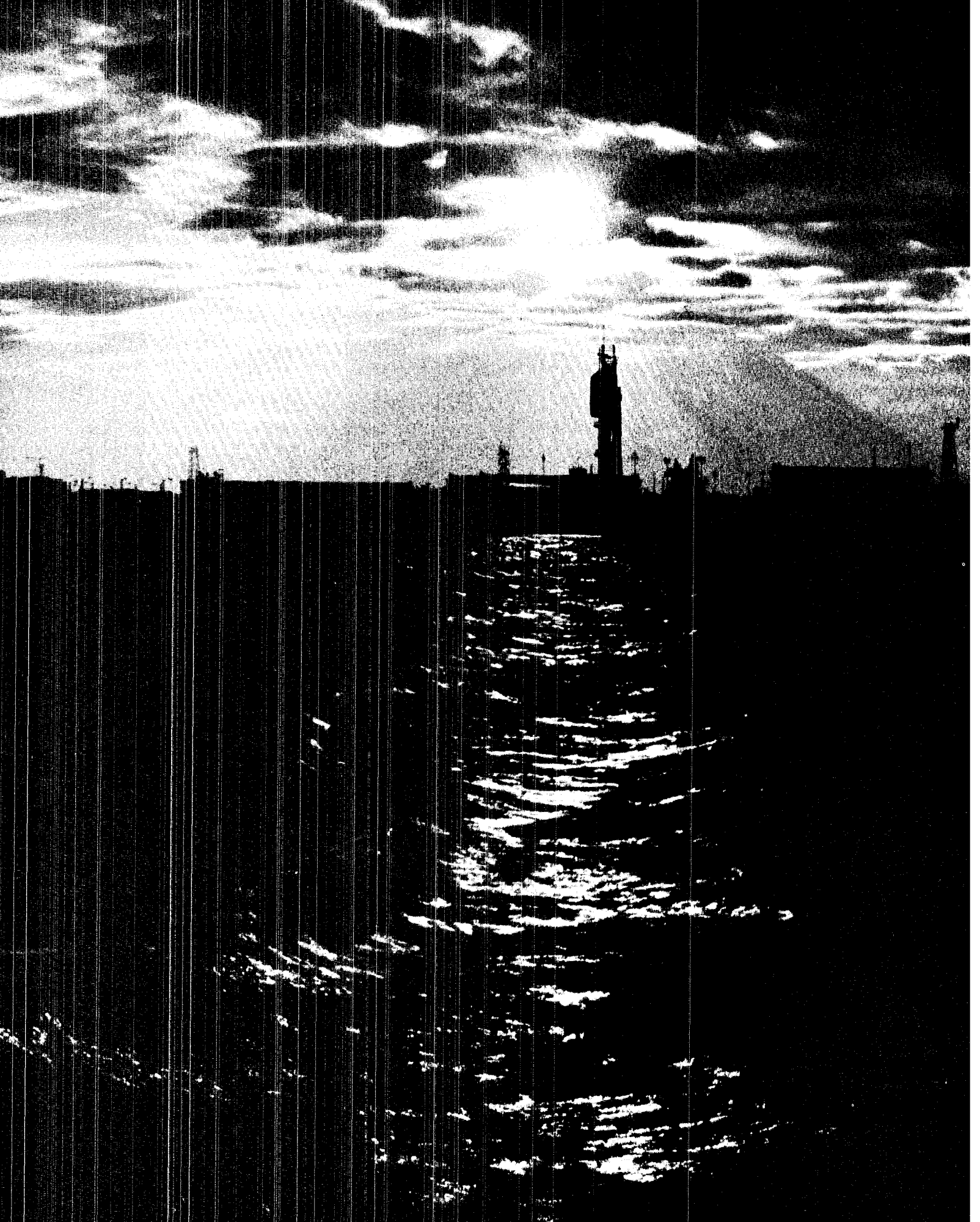
W. Tyler Aldrich, Jr., is assistant to Belcher for security liaison. Other members of his group are William Showers, Willie Ortiz and Lillian Chavez.

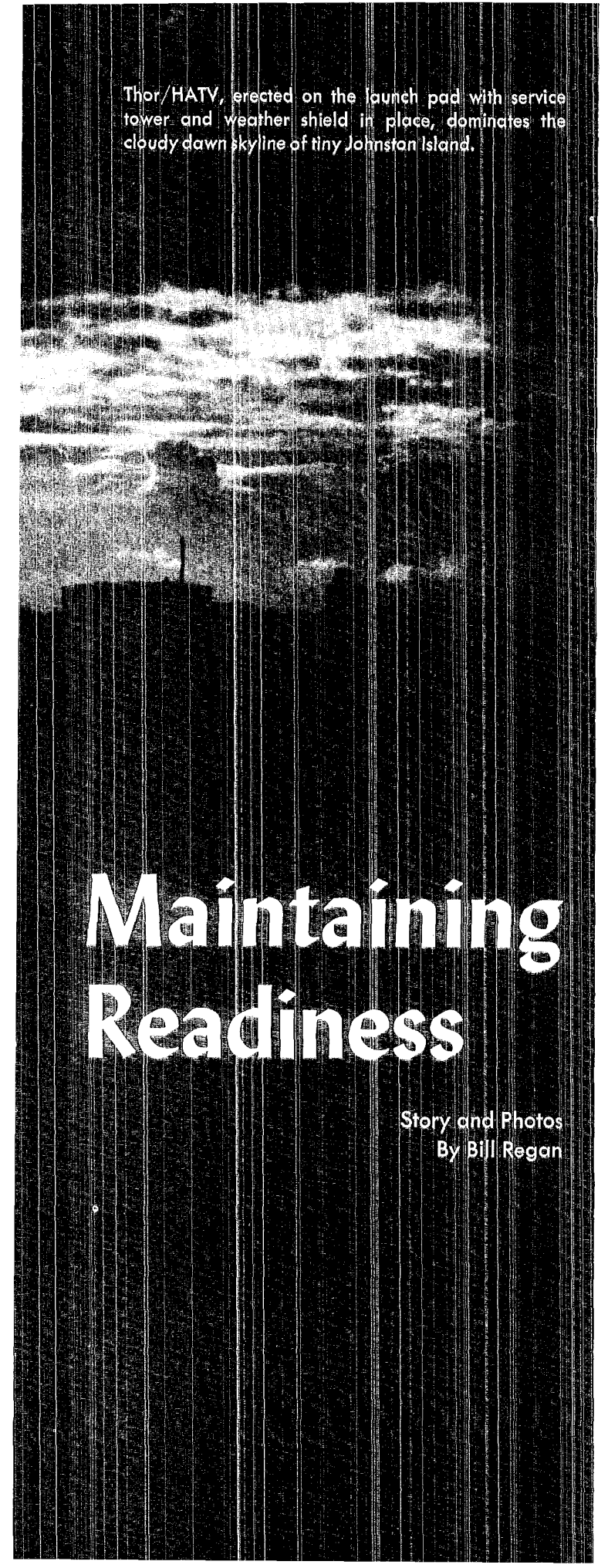
Heading the Information Services department of more than 170 persons is Delbert Sundberg, former head of the Public Relations department and Office of University Cooperation. Duties associated with the Office of University Cooperation have been transferred to Theodore Dunn, assistant personnel director.

Leslie Redman, formerly D-6 group leader, is associate department head of ISD, and Bill Regan, formerly PUB-1 group leader, is assistant department head for graphics and group leader of ISD-1 (Public Information).

Robert Porton is group leader of ISD-2 (Public Relations); Bill Johnson, ISD-3 (Illustration); J. Arthur Freed, ISD-4 (Library Services); David Heimbach, ISD-5 (Mail and Records); Robert Krohn, ISD-7 (Technical Information); and Robert Crook, ISD-7 (Graphic Arts).

Locations of these groups have not changed as a result of the reorganization.





Thor/HATV, erected on the launch pad with service tower and weather shield in place, dominates the cloudy dawn skyline of tiny Johnston Island.

Maintaining Readiness

Story and Photos
By Bill Regan

"All stations stand by to mark 60 seconds and counting. . . . MARK 60 SECONDS."

It is the 24th of September, 2:53:01 a.m. on Johnston Island, a tiny speck of coral in the Pacific Ocean, 700 nautical miles southwest of Honolulu. The rasping loudspeaker voice calls attention once more to the north edge of the island.

Gleaming white in the searchlights' glare, a specially-modified Thor rocket booster poised for flight, stands stark against the blackness of sea and sky. Atop the 57-foot booster is a high altitude test vehicle (HATV) designed and developed by Sandia Laboratories for the Department of Defense and the Atomic Energy Commission as a part of the nation's test readiness program. After the Senate ratified the 1963 Limited Nuclear Test Ban Treaty, Congress authorized the DOD/AEC to maintain a readiness to conduct nuclear tests in the atmosphere should they be deemed essential to national security.

Should national security ever again require such tests, HATV would serve as a sort of space suitcase to carry a nuclear device for detonation at a predetermined time and point in space. But for tonight's test no nuclear components or explosive warheads of any kind will be used. The payload contains only a test device simulator, a cone of 212 flashbulbs for optical recording at event point, and a piggyback physics experiment which will search for and characterize stellar x-ray sources.

Slightly more than three-quarters of a mile from the launch pad looms the massive four-story Joint Operations Center (JOC). Here Joint Task Force Eight and all its component groups, both military and civilian, headquarter for this operation which is now only minutes from culmination. On the roof task force photographers wait with batteries of long-lens cameras to record liftoff and flight. Also on the roof, LASL's Walt Wolff, J-8, waits to give a needed extra hand to "The Atom" photographic coverage. Wolff's primary assignment for the test is to observe timing and firing procedures and troubleshoot operational problems for the LASL group.

One floor below in Operations Control Center No. 1 (OCC-1) Rear Admiral Henry Suerstedt, Jr., JTF-8 commander, anxiously watches status boards and confers with his scientific deputy, Bob Brownlee of the Los Alamos Scientific Laboratory. Brownlee also commands the AEC Technical Task Group composed of LASL, Lawrence Radia-

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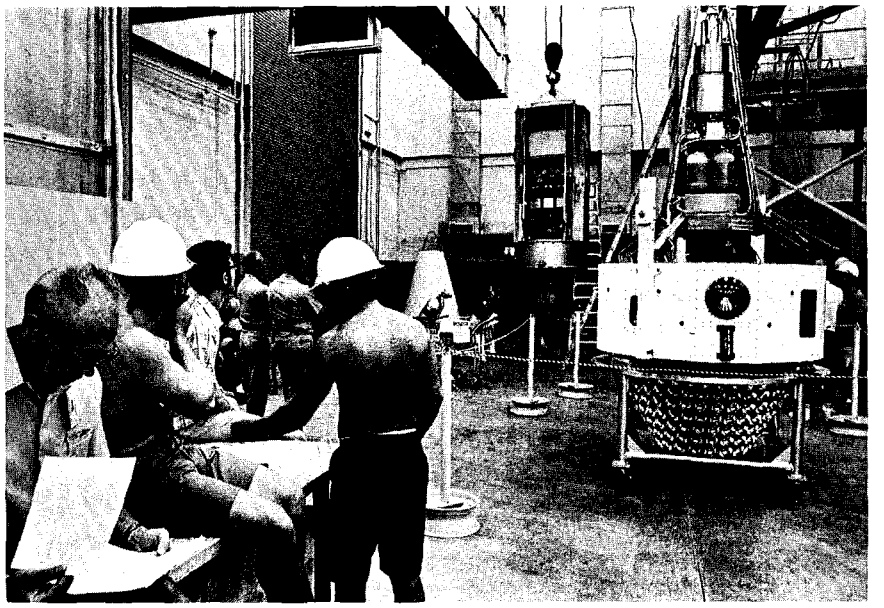

Left, John Malik, J-DOT and acting chairman of the JHEG, studies safety reports as Sandia and LRL scientific teams assemble the Thor payloads. In the foreground is the flash cone and simulated device. This was placed on top of the stellar x-ray experiment which is shown in the background. Beside the x-ray experiment is the nose cone which covered the top of the flash cone and simulated device. In the photo at right, the 16,000 pound HATV is ready to be hoisted to the top of the Thor service tower and mated to the rocket booster.

tion Laboratory and Sandia Laboratories and as scientific deputy is responsible for accomplishment of scientific test objectives. To Brownlee's right is Major Charles Heimach, Space and Missiles Systems Organization (SAMSO), commander of the DOD Technical Task Group, charged with responsibility for booster launch activities now nearing a climax. To the Admiral's left are Captain George A. Gowen, commander of the Navy Task Group whose ships and planes are patrolling the restricted danger zone surrounding the impact area and standing by for recovery of payload packages, and Colonel John W. Rawlings, Air Force Task Group commander. Colonel Rawlings directs the three AEC/Air Force NC-135 diagnostic aircraft and a weather recon WC-135 flying out of Hickam Air Force Base, Honolulu. The seconds click off and board lights are all green and GO.

Toward the back of the room scientific group commanders, Milt Peek, J-10, LASL, Ervin Woodward, LRL, and John Eckart, Sandia, sit at elevated work tables. Peek, who has the responsibility to assure that NC-135 aircraft instruments are looking at the right point in time and space, scans the status board with field glasses. At the same time he is talking on the hot line with Brownlee and Jim Wells, J-1, who is down the hall minding radio contact with the aircraft.

Peek's LRL and Sandia colleagues are equally busy with the phones. Woodward's LRL team provided the test device simulator and stellar x-ray experiment (SXRE), a unique system capable of gathering data that has been previously unobtainable. The SXRE detectors are 10 times more sensitive than those of any rocket experiment flown to date. Eckart's Sandia team designed and developed the HATV and are providing launch support as well as timing, data recording and various telemetry functions.

Crammed against the back wall of OCC-1 are observers' chairs for advisory group personnel, such as the Joint Hazards Evaluation Group (JHEG) and the Shot Panel, whose duties are not immediately involved with the operational activities now underway. Acting JHEG Chairman, LASL's John Malik, J-DOT, stands to get a better look at the plot board with ship and aircraft locations marked in bright orange. LASL JHEG member Dale Sappenfield and JHEG observer Ron Hyer, both J-10, are down the hall watching TV monitors showing the pad area.

A mile and a half to the north, the reflected lights of Akau Island, site of the Pacific Missile Range (PMR) tracking radars and computer center, shimmer on the black sea. In the computer center, Danny Stillman, LASL, J-8, waits for a high speed printer to start spewing out event prediction point data starting at 222 seconds after liftoff. Once the Thor has settled into its trajectory after engine cutoff, the powerful PMR tracking radars will feed payload location data into the computer. The computer is programmed to calculate, on the basis of actual flight (rather than expected flight), position of the payload at the specified event time and look angles from the planned position of the NC-135 aircraft. The information is refined every 10 seconds and printed out. The

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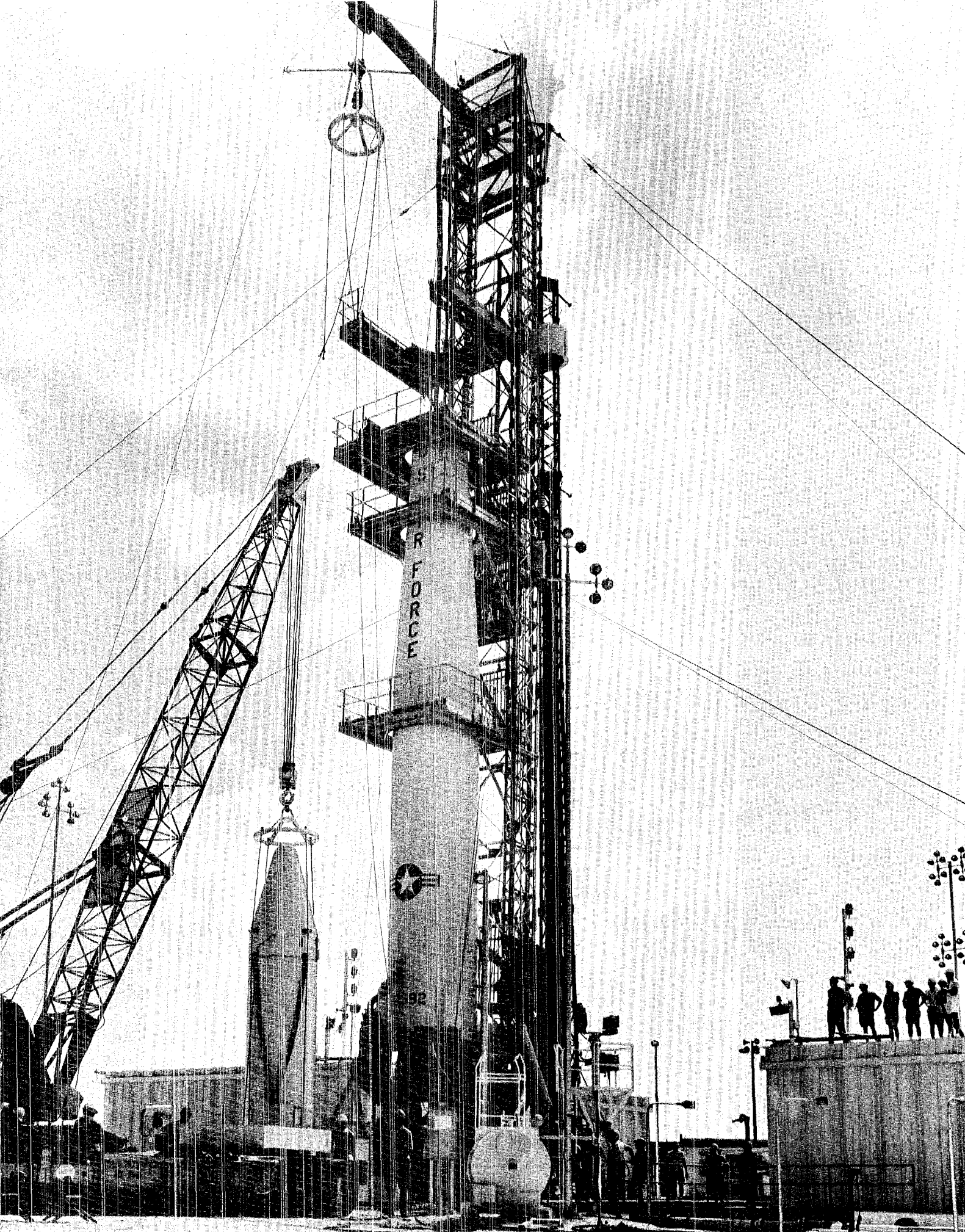

R FORCE

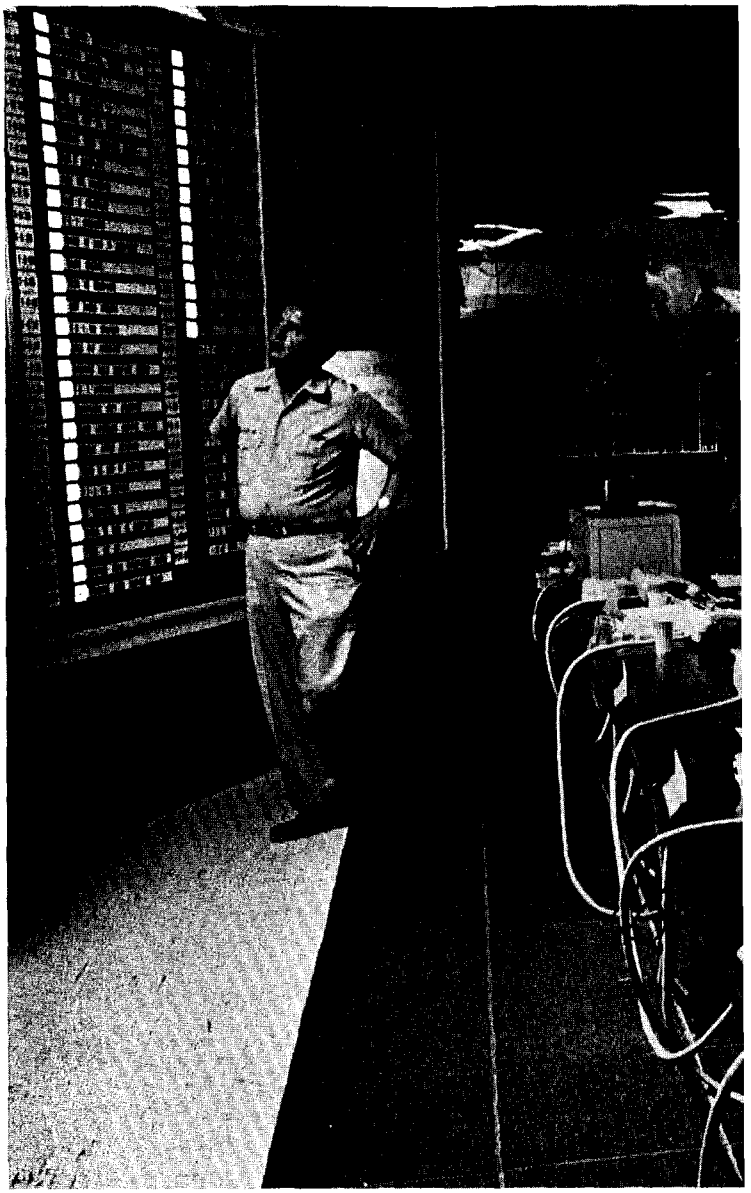
look angles are transmitted to the aircraft via radio-teletype and can be used to update or improve the positioning of instruments which will be looking at the event (in this case 212 flashbulbs igniting in the payload flash cone).

This method of event point prediction was successfully used by LASL observers in the Birdseed experiments last spring at the Kauai Barking Sands rocket launching facility. Precise pointing data becomes most important when very narrow field-of-view instruments are used. If the pointing error should be greater than an instrument's field-of-view angle no data will be obtained.

Down the hall from Stillman's location in the computer center is the PMR OCC, a dimly-lighted room lined with large illuminated plotting boards which will graphically display the radar tracking data after liftoff. Here sits Commander C. R. Clark, PMR missile flight safety officer. Above the plot boards are television screens showing the Thor and pad area. In case of unsafe rocket malfunction or off-course flight, Commander Clark decides when, where and if to push the destruct button.

"All stations stand by to mark 30 seconds and counting. . . . MARK 30 SECONDS."

Three hundred miles southeast of Johnston Island another group of LASL men led by J-16's Bob Peterson wait at their posts aboard the NC-135 flying laboratory No. 369. Lucien Black, Lee Sprouse, Dick Wakefield, John Wolcott, Dick Tatro and Neel Glass, all of J-16; Dwight Stephenson, Miles Hindman and Andy Koonce, all J-8; Don Collins, J-3, and Don Bartram, J-14, will be involved with experiments and testing of three



Left, watching intently as status board lights come on green and GO for the Thor/HATV launch are LASL's Bob Brownlee, JTF-8 scientific deputy; Rear Admiral Henry Suerstedt, Jr., JTF-8 commander; Captain George A. Gowen, commander of the Navy Task Group. Above, Colonel Don Flood takes a closer look at the status board in Operations Control Center No. 1 shortly after Thor/HATV was launched. At the command table are, left to right, Lieutenant Dave Schuckstes, Major Charles Heimach, Brownlee, Suerstedt, Gowen, and Colonel John Rawlings.

Milton Peek, J-10, LASL scientific commander, takes a close look at the status board after launch.

techniques of pointing aircraft data-recording instruments at an event in time and space.

The look angle of an inertial, gyroscopically stabilized camera platform originally developed for use on the March 7, 1970, solar eclipse will be offset a calculated distance from a star near the planned event position. If the event occurs at the planned spot in space and time, and if the aircraft is on the proper heading and at the planned position in space at event time, then the event will be photographed at the center of the camera's field-of-view.

The second method, event point prediction using tracking data from the Akau Island PMR radar/computer center, has already been described. The third method, designed and carried out by Sandia, uses an RF (radiofrequency) beacon signal from the Thor payload to position a tracking camera bench. This system has been in use for several years but never at such a long range (280 nautical miles) from the event position. The tracking camera bench system is also being used by the other two AEC diagnostic NC-135 aircraft which are positioned at closer distances. Sandia aircraft No. 370 with LASL's Don Westervelt, J-14, aboard in his role as associate scientific deputy for aircraft, is about 100 miles east of Johnston Island while LRL's No. 371 aircraft is about 170 miles farther out to the east.

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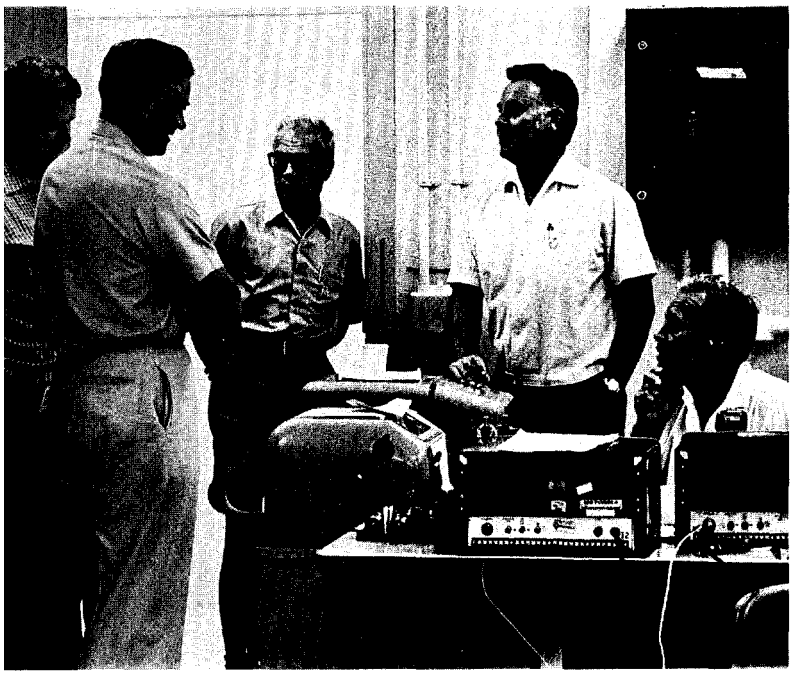
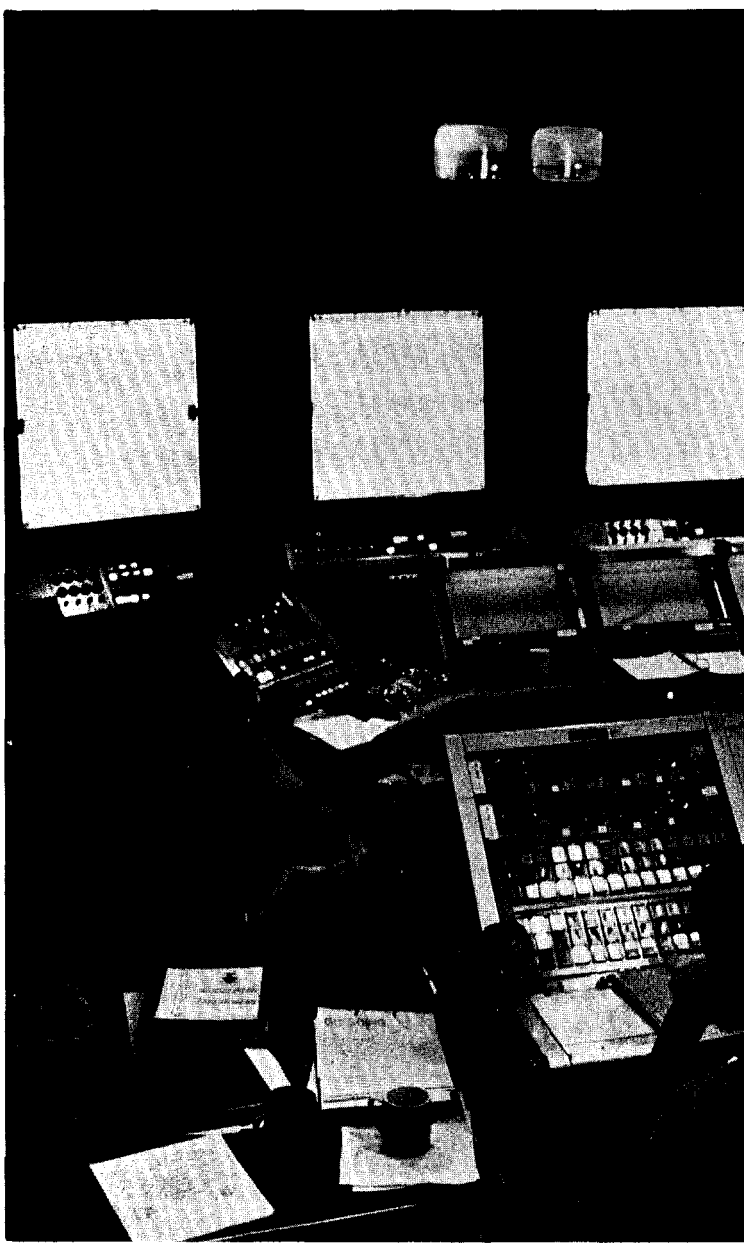


Jim Wells, J-1, talks on the hot line to the Akau Island computer center. Others, from left to right, are Peek, Rawlings, Malik, and Walt Wolff, J-8. In photo below, Pacific Missile Range personnel await liftoff in the dimly-lighted Akau Island operations control center.



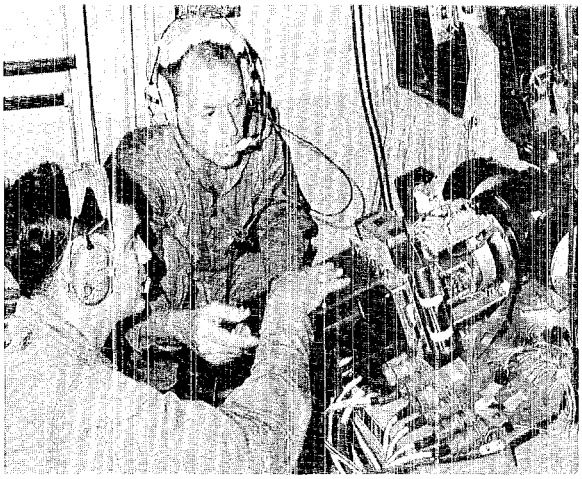
"All stations stand by to mark 20 seconds and counting. . . . MARK 20 SECONDS."

Outside the JOC building flashing red lights moving along the island roads mark security patrols which have cleared a danger area in a 4000-foot swath diagonally east across the island. All dormitories in this area have been evacuated for the launch. Bedding facilities have been provided outside the danger area, particularly in empty rooms of the JOC. But few of them are in use at this time, for island residents are out in force to see the blastoff.

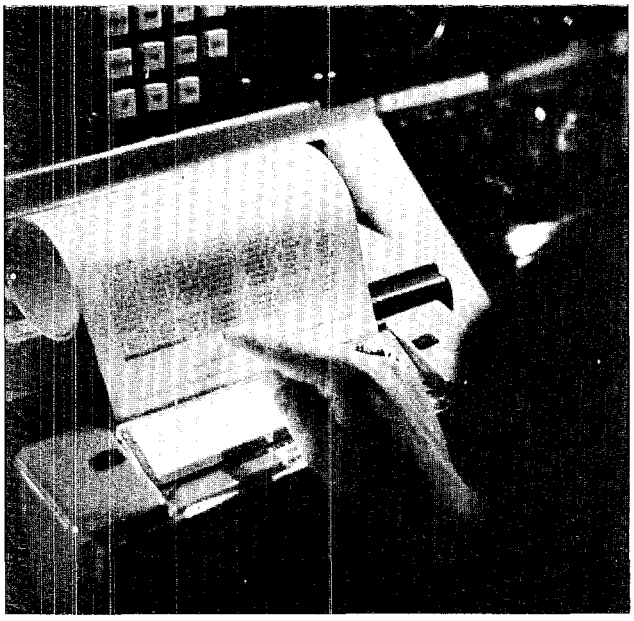
On the pad the 150,000-pound-thrust Thor vents a small cloud of LOX into the glare of the searchlights. The countdown, which started more than 10 hours earlier after the final briefiing and GO report of all task groups is nearly finished. 10 . . 9 . . 8 . . 7 . . 6 . . 5 . . 4 . . 3 . . 2 . . 1 . .

Smoke and flame pour out of the Thor and for what seems to be moments nothing else appears to happen. Then it starts to rise slowly on a growing column of flame which lights up the whole island. The Thor seems almost to hang at about 100 feet and then a rolling thunder reverberates off the JOC Building as the booster accelerates and accelerates ever faster. Now high above the island it climbs incredibly fast and pitches out to the east. Ground viewers are looking almost into the nozzle as a long tail of blue flame reflects off a wispy cloud high above.

Thor HATV has disappeared into a black sky



Left, John Wolcott and Dick Tatro, both-J-16, photographed the Thor/HATV event from NC-135 aircraft No. 369 with the LASL coronal camera. Below, also aboard the aircraft, Don Collins, J-3, and Bob Peterson, J-16, relied on this radio-teletype for data on event point prediction while the Thor was in flight. (Photos by Win Headdy, ISD-7).



filled with stars. Somewhere up there the payload has separated into two vehicles—the stellar x-ray package and the device simulator. The booster has been kicked away from the payload packages by auxiliary rockets. By 350 seconds after launch OCC-1 is empty except for a few communications people. All occupants are out on the balcony which opens off the back of the room. All eyes are straining at the predicted event location waiting for a flash from the payload flashbulb cone. At a moment before the planned event time of 718.9 seconds from liftoff a flash like a brighter star winks on and then off. Then came the surprise . . . a second flash winks and startles the observers. There was only supposed to be one. Which one was the flash cone? Was one flash a different color than the other? Was it a meteor? The questions came thick and fast and there was some intimation on the part of the people who were inside that the second flash (or was it the first one) was an illusion caused by straining the eyes. It was not an illusion. Two flashes were recorded on a single frame time-exposure color

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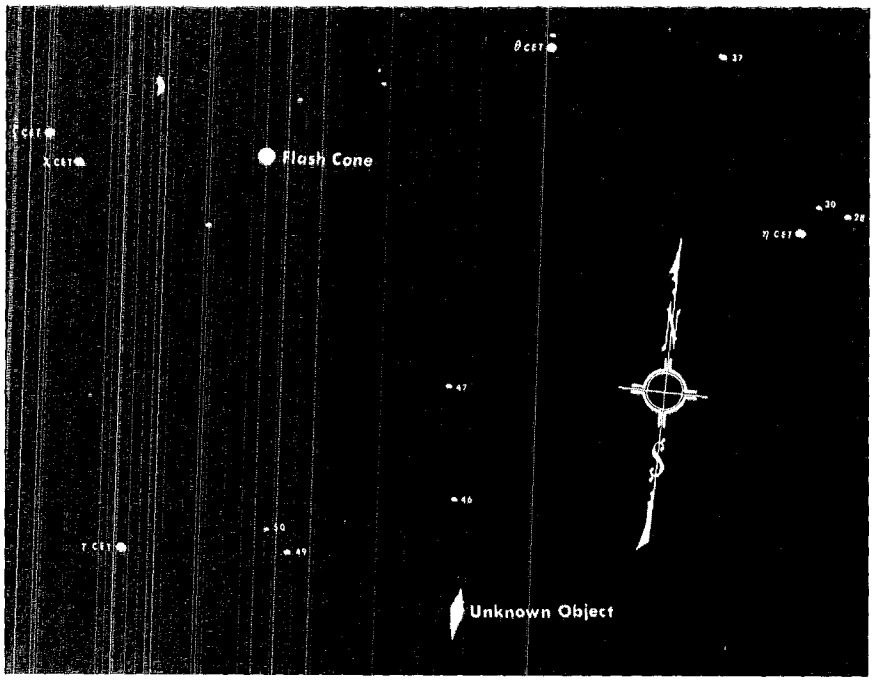
A flash of light, and then a second which startled observers, was recorded on film against the star field by Bill Isengard, JTF-8 photo officer.



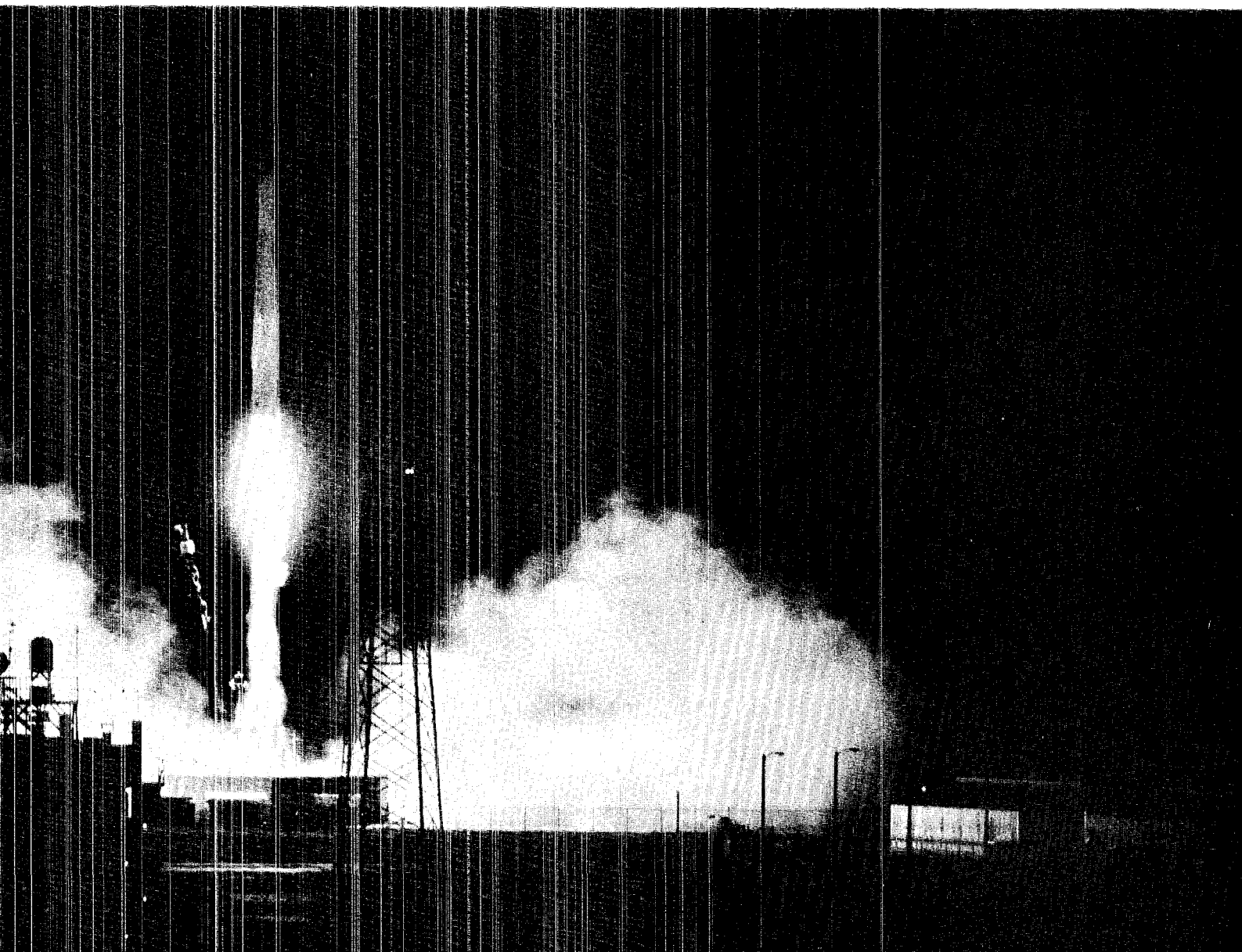
Thor/HATV is launched from Johnston Island.

photograph made by JTF-8 Photo Officer Bill Isengard confirming the reports of trained observers. Observers are agreed that the first flash was the extraneous one. On the photograph it is a short blue streak whereas the flash cone image appears as a single bright yellow round image of greater than first magnitude brightness. Both images are superimposed on a star field of the constellation Cetus. Preliminary spatial measurement of the photograph shows a seven degree separation of the two flashes. If one assumes that the flashes are the same distance from the observer, then the straight line separation of the two events is roughly 29 kilometers. This is approximately the distance between the payload and the booster as tracked by the PMR radar, but a greater distance than planned for booster displacement.

The reason for the extraneous blue flash is still unknown, although most observers are agreed that it came about one second earlier than event time; it is unlikely that it was a meteor; it could have come from the booster.

Seventeen minutes after launch, SXRE payload photographic and telemetry packages impacted in the recovery area 61.9 nautical miles from Johnston Island and were picked up by the destroyer escort USS McMorris. One hour later the preliminary report went out to all laboratories and the Defense Atomic Support Agency in Washington that test objectives were attained and systems functioned as planned.

At dawn the island was quiet. An empty and blackened launch pad on the north side was the only indication that anything of note had happened to disturb the stillness of night.



short subjects

Austin McGuire has joined the Director's office to coordinate non-AEC reimbursed work at LASL and to determine how such work could be expanded, utilizing present expertise and facilities, if appropriate and relevant to national needs.

Projects of this type are still approved by, and funded through, the AEC.

McGuire, a physicist, was a staff member at the Laboratory from 1954 until 1965. He returns after a year with Electro-Optical Systems, Inc., Pasadena, Calif.; two years with TRW Systems, Inc., Redondo Beach, Calif.; and two years with EG&G, Inc., Santa Barbara, Calif.

The Los Alamos Ski Club will hold its annual ski sale from 6:30 p.m. to 9:30 p.m., Nov. 11, in the High School Cafeteria. It will be the only ski sale this year.

Local merchants will display equipment and a nominal admission fee of ten cents will be charged to pay for use of the cafeteria.

George Kantor, who has been doing postdoctoral research with Group H-5 for the past two years, has been appointed assistant professor of biological sciences at Wright State University, Dayton, Ohio.

A new W-division group, W-10, has been formed at the Laboratory. The primary work of this group involves engineering and physics of x-ray interaction with materials.

Jack Fuller, formerly W-7 assistant group leader, heads the new group. **Richard Olwin,** formerly W-1 assistant group leader, is alternate group leader for W-10. **Robert Godwin,** formerly of W-7, and **Rodney Thurston,** formerly of W-4, are assistant group leaders.

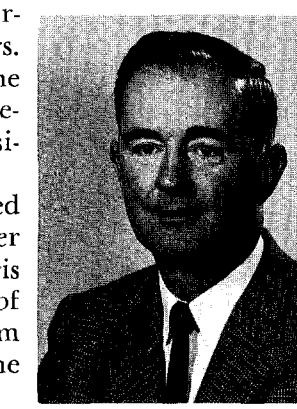
James Taub, CMB-6 group leader, has been named one of 200 charter Fellows of the American Society of Metals. The honor was conferred at the Inaugural Convocation of Fellows at Metals Park, Ohio, in October.

The honor ". . . is to provide recognition to ASM members for distinguished contributions in the field of metals and materials and to develop a broadly based forum for technical and professional leaders to serve as advisors to the Society as from time to time requested by the Board, and in such manner to enhance the capability of ASM as a technical and professional society to serve the technical community in the field of metals and materials."

Taub, a recognized leader in the field of metallurgy, in 1963 became the first metallurgist to receive the E. O. Lawrence Memorial Award.

Thomas Turner, MP-2 section leader, has retired after six years at the Laboratory. He joined P-11 in April, 1964, and transferred to MP-2 in 1965. He and his wife, Joy, live in Los Alamos.

Joseph Leary, CMB-11 alternate group leader, has been appointed as the United States' technical representative at the Nuclear Research Center in Karlsruhe, Germany, for two years. Upon completion of the assignment he will return to his present position at the Laboratory.



Leary was nominated for the post by former LASL Director Norris Bradbury. He was one of several nominees from AEC laboratories and the nuclear industry.

Leary has been employed at the Laboratory since 1944. His current work is primarily in the field of plutonium fuel sources for programs including the artificial heart, space electric power, civilian power reactors, and in providing supporting technology for the weapons program at LASL.

Accompanied by his wife, Terry, the scientist left Los Alamos for Karlsruhe last month.

the technical side

Presentation at Conference on Branch Solutions of Nonlinear Problems, Oberwolfach-Walke, Germany, July 26-Aug. 1:

"On Secondary Bifurcation of Eigensolution Branches with Hammerstein's Operator" by G. H. Pimbley, Jr., T-8 (invited)

Presentation at meeting of the Atlanta Chapter of the Health Physics Society, Atlanta, Ga., Aug. 3:

"Neutron Dosimetry" by D. E. Hankins, H-1 (invited)

Presentation at meeting of the Los Alamos Chapter, American Society for Metals, Aug. 26:

"Recent Developments in Plutonium Fuels at LASL" by J. A. Leary, CMB-11

Presentation at the 15th International Conference on High Energy Physics, Kiev, USSR, Aug. 26-Sept. 4:

"The Los Alamos Meson Physics Facility" by E. A. Knapp, MP-3 (invited)

Presentation at the Second International Conference on Strength of Metals and Alloys, Pacific Grove, Calif., Aug. 30-Sept. 4:

"The Effects of Strain Rate and Temperature Upon the Microstructure and Strength of Aluminum" by J. E. Hockett, CMF-13, and H. J. McQueen, Sir George Williams University, Montreal, Canada

"High Temperature Creep of Polycrystalline Graphite" by W. V. Green and E. G. Zukas, both CMF-13, and J. Woertman, Northwestern University, Evanston, Ill.

Presentation at the Triennial International Conference on Mass Spectrometry, Brussels, Belgium, Aug. 31-Sept. 4:

"The Use of a Highly Sensitive Mass Spectrometer for Thermodynamic and Phase Relationship Studies in Carbide Systems" by E. Storms, CMB-3

Presentation at the Fourth European Conference on Controlled Fusion and Plasma Physics, Rome, Italy, Aug. 31-Sept. 4:

"Variational Analysis of Linearized Vlasov Plasmas" by H. R. Lewis, P-18 (invited)

"Z-Pinch Driven by Magnetic Energy Storage" by J. N. DiMarco and L. C. Burkhardt, both P-14

"Helical Equilibrium and Stability Experiments in a Three-Meter Linear Theta Pinch" by W. E. Quinn, F. L. Ribe, and R. E. Siemon, all P-15

Presentation at Conference on the Properties of Nuclei Far from the Region of Beta-Stability, European Organization for Nuclear Research, Leysin, Switzerland, Aug. 31-Sept. 4:

"A Mass Law with Model-Based Shape-Dependent Shell Terms" by P. A. Seeger, W-8 (invited)

"On-Line Investigation of Independent Cesium Yields in ^{236}U Fission: Identification of ^{145}Cs" by L. Forman, J-16, S. J. Balestrini, N-2, K. Wolfsberg, J-11, and T. R. Jeter, U.S. Army Ballistic Research Laboratories, Aberdeen Proving Ground, Md.

"Theoretical Predictions for Superheavy Nuclei" by J. R. Nix, T-9 (invited)

Presentation at the Third International Symposium on Polarization Phenomena in Nuclear Reactions, Madison, Wisc., Aug. 31-Sept. 4:

"Comparison of Double Scattering and Polarized Ion Source Measurements of Helium-4 (Deuteron, Deuteron) Helium-4 Polarization at 11.5 Million Electron Volts" by V. S. Starkovich, W-10, and G. G. Ohlsen, P-DOR

"A Reactance Matrix Analysis of the Deuteron-Helium-3, Proton-Helium-4 System at 10 Million-Electron-Volt Deuteron Laboratory Energy" by G. M. Hale and D. C. Dodder, both T-9, and Kathleen H. Witte, C-7

"Performance of the LASL Polarized Source" by J. L. McKibben and G. P. Lawrence, both P-9, and G. G. Ohlsen, P-DOR

"Neutron Polarization in the Triton(Deuteron, Neutron)Helium-4 Reaction Using a Polarized Incident Beam" by W. B. Broste, G. G. Ohlsen and J. E. Simmons, all P-DOR, and G. P. Lawrence and J. L. McKibben, both P-9

"Preliminary Measurements of Neutron Polarization from the Deuteron(Deuteron, Neutron)Helium-3 Reaction at Zero Degrees Using a Polarized Incident Beam" by J. E. Simmons, W. B. Broste and G. G. Ohlsen, all P-DOR, and G. P. Lawrence, P-9

"Absolute Beam Polarization Determination for the LASL Lamb-Shift Source by the Quench Ratio Method" by G. G. Ohlsen and P. W. Keaton, Jr., both P-DOR, G. P. Lawrence and J. L. McKibben, both P-9, and D. D. Armstrong, P-12

"A Study of the Helium-3(Deuteron,Proton)Helium-4 Reaction" by P. W. Keaton, Jr. and G. G. Ohlsen, both P-DOR, D. D. Armstrong, P-12, D. C. Dodder, T-9, G. P. Lawrence and J. L. McKibben, both P-9

"A Rapid Method for the Measurement of Analyzing Tensors in Reactions Induced by Polarized Deuterons" by G. P. Lawrence and J. L. McKibben, both P-9, and G. G. Ohlsen and P. W. Keaton, Jr., both P-DOR, and D. D. Armstrong, P-12

"A Proposed Ultra-Low Temperature Polarized Target for Use with Single-Burst Neutron Sources" by J. R. Lemley and G. A. Keyworth, both P-3

"An Underground Nuclear Explosion as a Polarized Neutron Source" by G. A. Keyworth and J. R. Lemley, both P-3

"Asymmetries in Protons from the Reaction of Deuterons with a Polarized Three-Helium Target" by B. E. Watt, P-DOR, and W. T. Leland, P-10

"Phase Shifts from Neutron-Helium-4 Elastic Scattering Experiments at Energies Near 20 Million Electron

continued on next page

Volts" by M. Drosg, J. C. Hopkins and J. D. Seagrave, all P-DOR, and A. Niiler, formerly P-DOR

"*Characteristics of Aluminum* Potassium Sulfate and Aluminum Ammonium Sulfate Alum as New Materials for Polarized Proton Targets" by P. J. Bendt, CMF-9

"Elastic Scattering of Polarized Tritons" by D. D. Armstrong, P-12, P. W. Keaton, Jr., P-DOR, and L. R. Veeser, W-8

"Description of Polarization Transfer Experiments" by G. G. Ohlsen and P. W. Keaton, Jr., both P-DOR, and J. L. Gammel, T-9

Presentation at the 25th National Conference, Association for Computing Machinery, New York, Sept. 1-3:

"The Role Computers Play in LASL's Neutron Cross-Section Program Using Neutrons from an Underground Nuclear Explosion" by G. F. Auchampaugh, P-3 (invited)

Presentation at meeting sponsored by the Atlas Computer Laboratory, Oxford, England, Sept. 1-4:

"Properties of New Numerical Approximations to the Transport Equation" by K. D. Lathrop and B. G. Carlson, both T-1 (invited)

Presentation at the 16th Colloque Ampere "Magnetic Resonances and Related Phenomena," Bucharest, Romania, Sept. 1-5:

"Relativistic Calculations of $<r^{-3}>$ and Other $<r^{n}>$ Parameters Encountered in Magnetic Resonance of Rare-Earth Ions and Atoms" by W. B. Lewis, CMF-2

Presentation at the Ninth Informal Conference on Photochemistry, Ohio State University, Columbus, Sept. 2-4:

"Photochemistry of Polluted Air Containing Hydrogen Peroxide Vapor" by N. R. Greiner, GMX-2

Presentation at the Eighth International Congress of Biochemistry, Symposium on Protein Structure, Interlaken, Switzerland, Sept. 3-5:

"Oxygen-17 NMR Relaxation in Aqueous Solutions of Methemoglobin and Metmyoglobin" by N. A. Matwiyoff, CMF-4, and C. T. Gregg, H-4

Presentation at the 12th International Conference on Low Temperature Physics, Kyoto, Japan, Sept. 4-10:

"Thickness of the Static and Moving He II Film" by W. E. Keller, CMF-9

"Propagation of Second Sound in Solid 3-Helium" by W. C. Overton, Jr., P-8, and C. C. Ackerman, E. I. duPont deNemours, Kinston, N.C.

"Oscillations and Dissipation in the Flow of the Saturated Helium Film" by E. F. Hammel, W. E. Keller, and R. H. Sherman, all CMF-9

"Vortex Motion in Helium II" by L. J. Campbell, CMF-9

"The Fe-57 Mossbauer Effect in Strong-Coupled Superconductors" by R. D. Taylor and J. C. Norvell, both P-8, and P. P. Craig and T. A. Kitchens, both Brookhaven National Laboratory, Upton, N. Y.

Presentation at International Conference On Electromagnetic Isotope Separators and the Techniques of their Applications, Marburg, Germany, Sept. 7-10:

"On-Line Isotope Separator Project Proposed for LAMPF" by B. J. Dropesky, J-11

"An On-Line Technique for Measuring Independent Fission Yields" by S. J. Balestrini, N-2, L. Forman, J-16, K. Wolfsberg, J-11, and T. R. Jeter, U.S. Army Ballistic Research Laboratories, Aberdeen Proving Ground, Md.

Presentation at the International Atomic Energy Agency Symposium on Developments in the Management of Low and Intermediate Level Radioactive Wastes, Aix-en-Provence, France, Sept. 7-11:

"Replacement of an Old Treatment Plant, A Design Based on Experience" by L. A. Emelity and C. W. Christenson, both H-7

Presentation at the Eighth International Conference on Microwave and Optical Generation and Amplification Meeting, Amsterdam, The Netherlands, Sept. 7-11:

"Transverse Effects in the High-Power Multicavity Klystron" by P. J. Tallerico, MP-2

Presentation at the Molecular Spectroscopy Symposium, Ohio State University, Columbus, Sept. 8-12:

"The CN Violet Absorption Spectrum Observed During the Flash Photolysis of BrCN" by R. Engleman, Jr., GMX-2

"Infrared and Single Crystal Raman Spectra of Cesium Lithium Cobalticyanide, $Cs_2LiCo(CN)_6$" by B. I. Swanson and L. H. Jones, both CMF-4

"Normal Coordinate Treatment of the Cobalticyanide Ion, $[Co(CN)_6]^{-3}$" by L. H. Jones, B. I. Swanson and M. N. Memering, all CMF-4

"Vibrational Spectrum and Force Field of Osmium Tetroxide" by R. S. McDowell and M. Goldblatt, both CMF-4

Presentation at seminar at Gulf General Atomic, San Diego, Calif., Sept. 9:

"Recent Studies in High Temperature Chemistry" by M. G. Bowman, CMB-3 (invited)

Presentation at Conference on Surface Studies, Sandia Laboratories, Albuquerque, Sept. 9-11:

"Nucleation, Acceleration, and Diffusion in the Interaction of D_2 with U" by R. M. Alire and C. L. Peterson, both W-7, and Barbara A. Mueller, CMF-5

"High-Vacuum Glow-Discharge Etcher and Ion-Thinner" by J. W. Ward, CMF-5 (invited)

Presentation at the 160th Annual Meeting of the American Chemical Society, Chicago, Ill., Sept. 13-18:

"Low Molecular Weight, Methylated RNA's of Cultured Chinese Hamster Cell Post-Ribosomal Particles" by M. D. Enger, R. A. Walters, A. G. Saponara, and A. E. Hampel, all H-4

"Nuclear Chemistry Plans for the Los Alamos Meson Physics Facility" by B. J. Dropesky and A. E. Norris, both J-11 (invited)

"Identification of C-4 Methyl Intermediates in Cholesterol Biosynthesis after Treatment of Rat Liver **In Vitro** with Cholestan-3β, 5α, 6β-

Triol" by T. J. Scallen and A. K. Dhar, University of New Mexico, and E. D. Loughran, GMX-2

"Radioisotope Production at the Los Alamos Meson Physics Facility for Medical Use" by H. A. O'Brien, Jr., Dir. Off., and M. E. Schillaci, MP-7 (invited)

"Identification of a High-Spin Isomer of ^{152}Pm" by Darleane C. Hoffman and W. R. Daniels, both J-11

"Concerning the Role of Pyrimidine Clusters in Transcription" by D. A. Smith, F. N. Hayes, A. M. Martinez, R. L. Ratliff and D. L. Williams, all H-4

"Crystal Structure of KSb_2F_7—on the Existence of the $Sb_2F_7^-$ Ion" by S H. Mastin, formerly CMF-4, and R. R. Ryan, CMF-4

"Recent Progress in Controlled Thermonuclear Fusion Research" by J. L. Tuck, P-DO

"Conjectures on the Nature of Ball Lightning" by J. L. Tuck, P-DO (invited)

"A Discussion with L. A. Artsimovich before the Fusion Research Study Group on the Future of Fusion" by J. L. Tuck, P-DO (invited)

"Experimental and Dirac-Fock Spectroscopic Parameters in the *Interpretation of* $5f^3$ AmO_2^+ *Spectra*" by L. P. Varga, J. B. Mann, L. B. Asprey and M. J. Reisfeld, all CMF-4

"Electronic Spectra of the $5f^3$ Actinides. The f^3 Intermediate Coupling Diagram" by M. J. Reisfeld, L. P. Varga and L. B. Asprey, all CMF-4

Presentation at the Third European Symposium on Fluorine Chemistry, Aix-en-Provence, France, Sept. 14-17:

"Systematics in Optical and Structural Properties of Actinide-Lanthanide Fluoride Complexes" by R. A. Penneman, CMF-4 (invited)

Presentation at the 13th International Conference on Coordination Chemistry, Cracow-Zakopane, Poland, Sept. 14-22:

"Interatomic Forces in Molecules as Determined from Vibrational Spectroscopy" by L. H. Jones, CMF-4 (invited)

Presentation at the Symposium on Survival of Food Crops and Livestock in the Event of Nuclear War, Brookhaven National Laboratory, Upton, N.Y., Sept. 15-18:

"Species Recovery from Radiation Injury" by J. F. Spalding and L. M. Holland, both H-4 (invited)

Presentation at the Second International Conference on Numerical Methods in Fluid Dynamics, University of California, Berkeley, Sept. 15-19:

"An Arbitrary Lagrangian-Eulerian Computing Technique" by C. W. Hirt, T-3

"LINC Method Extensions" by T. D. Butler, T-3

"Implicit Solution of Creeping Flows, with Application to Continental Drift" by W. E. Pracht, T-3

"Inclusion of Turbulence Effects in Numerical Fluid Dynamics" by B. J. Daly and F. H. Harlow, both T-3

"Numerical Calculation of Fluid Flows at Arbitrary Mach Number" by F. H. Harlow, A. A. Amsden and C. W. Hirt, all T-3

"Recent Extensions to the Marker-And-Cell Method for Incompressible Fluid Flows" by B. N. Nichols, T-3

Presentation at Seminar on Radiation Protection Problems Relating to Transuranium Elements, Karlsruhe, Germany, Sept. 20-25:

"Experience with Handling Transuranium Elements at Los Alamos" by R. A. Penneman, CMF-4, and L. J. Johnson, H-1 (invited)

"Remarks on the Production Aspects of the Transplutonium Research Program in the United States" by R. A. Penneman, CMF-4 and D. E. Ferguson, Oak Ridge National Laboratory, Tenn.

Presentation at the Intersociety Energy Conversion Engineering Conference, Las Vegas, Nevada, Sept. 21-25:

"Economic Considerations and Magnetic Energy Storage for High-Beta, Pulsed Reactors" by F. L. Ribe, P-15

"High Voltage Test of a Large Cryogenic Coil for Magnetic Energy Storage System" by E. R. Lady, *formerly CMF-9, and* D. L. Call, P-16

Presentation at the Interagency Mechanical Operations Group Joining Subgroup Meeting, Mound Laboratory, Miamisburg, Ohio, Sept. 22-24:

"Recent Developments in Electron Beam Welding at the Los Alamos Scientific Laboratory" by D. J. Sandstrom, CMB-6

Presentation at Symposium on Fusion Technology, Julich, Germany, Sept. 22-26:

"The Design and Installation of Scyllac, a 15-M Theta Pinch Experiment" by E. L. Kemp, G. P. Boicourt, C. F. Hammer and K. W. Hanks, all P-16, and R. F. Gribble, W. E. Quinn and G. A. Sawyer, all P-15

Presentation at Conference on Computer Applications in Radiology, University of Missouri School of Medicine, Columbia, Sept. 23-26:

"Enhancement of Radiographic Images Using a Large-Scale, Multi-Programming Computer" by B. R. Hunt and R. K. Zeigler, both C-5

Presentation at the Applied Mathematics Division Colloquium, Argonne National Laboratory, Ill., Sept. 24:

"Comparison of Numerical Quadrature Algorithms" by D. K. Kahaner, C-6 (invited)

Presentation at seminar in Nuclear Engineering, University of New Mexico, Albuquerque, Sept. 25:

"Some Scientific Applications of Nuclear Explosives" by G. A. Cowan, J-11 (invited)

Presentation at the International Meeting on Fast Reactor Fuel and Fuel Elements, Karlsruhe, Germany, Sept. 28-30:

"Synthesis, Fabrication, and Behavior of Single Phase U-Pu Carbides for Fast Breeder Reactors" by J. A. Leary, A. E. Ogard, M. W. Shupe, and J. Barner, all CMB-11

Presentation at seminar at Wayne State University, Detroit, Mich., Sept. 30:

"Neutron Dosimetry" by D. E. Hankins, H-1 (invited)

20 years ago in los alamos

Culled from the Nov., 1950, files of the Santa Fe New Mexican by Robert Porton

Man Gets Nickel's Worth

Telephone workers at this government installation are not on strike, but some of the equipment is a bit recalcitrant. The town police received a call from a man who said he had been in a telephone booth 45 minutes. The door was jammed shut and he couldn't get out. Police rescued the captive but didn't refund his nickel.

Political Parties List Platforms

The county organizations of the two major political parties have released their first platforms for Los Alamos voters to consider. Included are: Democratic—(1) Reciprocal law for dentists; (2) Short cut highway between Los Alamos and Santa Fe; (3) Creation of a state arts commission; (4) Legislation for getting two state representatives for Los Alamos and possibly a state senator; (5) Increase in salary for Los Alamos county officials (present salary—$1 per year). Republican—(1) No diversion of school funds to general fund—school tax money for schools; (2) Liquor control by bi-partisan board; (3) Establishment of a juvenile court and detention home for juveniles; (4) Elimination of politics from relief administration; (5) Constitutional amendment for selection of judges—probate, district and supreme courts.

Los Alamos Homes To Get Fences

The landlord is going to put up some fences on the Hill. Fencing for some homes will begin according to the AEC's Construction Division. Scarcity of materials and other factors have been mentioned, delaying the start of the program. The work is part of a general erosion control contract. Only permanent homes in the Western area, Denver Steels and Group 11's in the North Community will be fenced under the contract.

Old Building Starts Life All Over

The frame building that was formerly the Hill Theatre is starting a new career. It is now resting on new foundations at the Baptist Church site, and, after a remodeling job, it will become the Hill's first strictly denominational church. Known as Theatre No. 1 when it was built in 1943, it had many uses, including occasional religious services. The structure was located in the military barracks area in the eastern segment of Trinity Drive. The Baptist Church group purchased the building as surplus material after leasing a plot of ground on Diamond Drive. A large crew was necessary to make the move to its new location.

what's doing

PUBLIC SWIMMING: High School Pool—Monday through Wednesday, 7:30 to 9 p.m., Saturday and Sunday, 1 to 6 p.m., Adult Swim Club, Sunday, 7 to 9 p.m.

SIERRA CLUB: Luncheon meeting at noon, first Tuesday of each month, South Mesa Cafeteria. For information call Brant Calkin, 455-2468, Santa Fe.

RIO GRANDE RIVER RUNNERS: Meetings scheduled for noon, second Tuesday of each month at South Mesa Cafeteria. For information call Joan Chellis, 662-3836.

OUTDOOR ASSOCIATION: No charge, open to the public. Contact leaders for information regarding specific hikes.
Nov. 7—Bandelier Hike, Ken Ewing, 662-7488
Nov. 22—Medio Canyon, Dorothy Hoard, 672-3356

LOS ALAMOS FILM SOCIETY: Nov. 18, 7:30 p.m., Civic Auditorium: "The Funniest Man in the World." Admission: members—$.75; others—$2.50.

LOS ALAMOS CONCERT ASSOCIATION: Dec. 1, 8:15 p.m., Civic Auditorium: "Olaeta Basque Festival of Bilbao." For information call Margaret Hagerman, 662-7389.

NEWCOMERS: Nov. 18, 6:30 p.m., Recreation Hall, tasting party and election of officers. For information call Judy Ware, 662-5745.

MOUNTAIN MIXERS SQUARE DANCE CLUB: For information call Mrs. Joyce Headdy, 672-3783.
Nov. 7—Canyon School, 8 p.m., Ken Hostetler, Albuquerque, caller
Nov. 21—Canyon School, 8 p.m., Nelson Watkins, Roswell, caller.

LOS ALAMOS GEOLOGICAL SOCIETY: Earth Treasure Show, Recreation Hall, Dec. 5, 10 a.m. to 10 p.m.; Dec. 6, 10 a.m. to 6 p.m. Door prizes, demonstrations, movies and displays. For information call Gordon Anderson, 662-6058.

MESA PUBLIC LIBRARY: Oct. 8 to Nov. 17, display, "Cooking with Copper."
Nov. 17 to Dec. 1, Los Alamos Association of Retarded Children, stitchery exhibit.
Nov. 1 to Nov. 30, exhibit, "The Face of the Netherlands."

LOS ALAMOS SINFONIETTA CONCERT, Nov. 15, 7:30 p.m., First United Methodist Church, Don Beene and James Young conducting. Door prices—$1.50 and $.75. Joint Choral Society-Sinfonietta season tickets available at concert—Adults, $5; Students, $2. (Will include admission to opera benefit performance of "Elijah" in Santa Fe Opera Amphitheatre). For information call 662-3009.

Included in the program of the recent Vulnerability, Lethality, and Effects Symposium at the Los Alamos Scientific Laboratory were panel discussions. Members of one of these panels were, from left to right, LASL's Don Byers, alternate W-division leader; USAF Major General Edward Giller, the AEC's assistant general manager for military applications; Jacob Gilstein, director of the U.S. Army's Advanced Ballistic Missile Defense Agency; Jack Howard, vice president at Sandia Laboratories; and George Millburn, Aerospace Corporation.

Henry T. Motz
3187 Woodland
Los Alamos, New Mexico 87544

Jane Hall, former assistant director of the Los Alamos Scientific Laboratory, was presented the Atomic Energy Commission Citation during special ceremonies last month. At left, offering their congratulations are H. J. Blackwell, manager of the AEC's Los Alamos Area Office, and AEC Commissioner Theos Thompson. At right are AEC Chairman Glenn Seaborg who presented the award, and LASL Director Harold Agnew. The citation is presented to persons who have made especially meritorious contributions to, or have been clearly outstanding in, the nuclear energy program.